Amendments to the Claims

This listing of the claims will serve to replace all prior versions, and listings, of claims in the application:

Listing of Claims:

--1. (currently amended) A rider controlled two-wheeled ~~vehicle~~ vehicular motion simulation arrangement comprising:

a mobile platform;

a simulated two-wheeled vehicle with a frame, a front wheel rotatably retained relative to the frame, a rear wheel rotatably retained relative to the frame and a steering arrangement for enabling a steering of the front wheel;

a means for retaining the simulated two-wheeled vehicle relative to the platform ~~wherein the means for retaining the simulated two-wheeled vehicle comprises a means for retaining the simulated two-wheeled vehicle relative to the platform~~ with a roll axis;

means for enabling a rider to impart control inputs to the simulated two-wheeled vehicle and to the mobile platform comprising an accelerator control and a steering arrangement with an axis of rotation; and

a control system for imparting motion to the platform and the two-wheeled vehicle in response to control inputs from a rider wherein the control system comprises a propulsion arrangement for propelling the mobile platform in response to control input from the accelerator control, a steering arrangement for steering the mobile platform in response to control input from the steering arrangement, a rear wheel propulsion arrangement for imparting angular velocity to the rear wheel of the simulated two-wheeled vehicle in response to control input from the

accelerator control, and a tilting arrangement for tilting the two-wheeled vehicle through bank angles relative to the mobile platform.

2. (canceled)

3. (new) The two-wheeled vehicular motion simulation arrangement of claim 1 wherein the mobile platform comprises an upper platform and a lower platform, wherein the upper platform is pivotally retained relative to the lower platform, and wherein the two-wheeled vehicle is supported for pivoting with the upper platform.

4. (new) The two-wheeled vehicular motion simulation arrangement of claim 3 further comprising inertial sensors operably associated with the two-wheeled vehicle for sensing accelerations of the two-wheeled vehicle.

5. (new) The two-wheeled vehicular motion simulation arrangement of claim 3 further comprising load sensors operably associated with the two-wheeled vehicle for sensing load distributions of the two-wheeled vehicle.

6. (new) The two-wheeled vehicular motion simulation arrangement of claim 3 further comprising foot members for engaging feet of a rider and wherein load sensors are operably associated with the foot members for sensing force applied by a rider.

7. (new) The two-wheeled vehicular motion simulation arrangement of claim 1 further

comprising a front wheel propulsion arrangement for imparting angular velocity to the front wheel of the simulated two-wheeled vehicle.

8. (new) The two-wheeled vehicular motion simulation arrangement of claim 1 wherein the two-wheeled vehicle further comprises a steering fork and wherein the tilting arrangement comprises a forward support rod with a first end coupled to the steering fork and a second end pivotally retained relative to the mobile platform and a rearward support rod with a first end coupled to the frame and a second end pivotally retained relative to the mobile platform

9. (new) The two-wheeled vehicular motion simulation arrangement of claim 8 wherein the second end of the rearward support rod is pivotally retained relative to the platform by a ball joint.

10. (new) The two-wheeled vehicular motion simulation arrangement of claim 9 wherein the rearward support rod and the ball joint relative to which it is retained are drivably associated with a quick response motion arrangement for imparting lateral movement to the support rod and the ball joint.

11. (new) The two-wheeled vehicular motion simulation arrangement of claim 10 wherein the quick response motion arrangement comprises a torquing motor, a proximal control arm with a first end coupled to the torquing motor, and a distal control arm with a first end coupled to the proximal control arm and a second end drivingly associated with the ball joint.

12. (new) The two-wheeled vehicular motion simulation arrangement of claim 8 wherein the forward support rod is extensible and retractable in relation to the mobile platform to enable the two-wheeled vehicle to be pitched.

13. (new) The two-wheeled vehicular motion simulation arrangement of claim 1 wherein the front wheel and the axis of rotation of the steering arrangement establish a positive caster distance C and wherein the control system imparts motion to the platform and the two-wheeled vehicle according to a Theoretical Method of Operation wherein:

$$T_z = (F_z)(C)(\sin \theta_z)$$

Where,

F_z is a vertical force component exerted by a support surface in opposition to a downward force component exerted by the front wheel during a turn;

θ_z is a bank angle to which the two-wheeled vehicle is tilted away from vertical; and

T_z is a torque produced by the vertical force component F_z.

14. (new) The two-wheeled vehicular motion simulation arrangement of claim 13 wherein the Theoretical Method of Operation further operates under the equation:

$$T_x = (F_x)(C)(\cos\theta_z)$$

Where,

F_x is a lateral force component exerted by the support surface in opposition to a lateral force component exerted by the front wheel during a turn; and

T_x is a torque produced by the lateral force component F_x.

15. (new) The two-wheeled vehicular motion simulation arrangement of claim 14 wherein the Theoretical Method of Operation further operates in response to a change in a center of gravity relative to the two-wheeled vehicle under the equation:

$$\text{Roll Acceleration} = (\Delta CG/R^2)(G/\cos \theta_z)$$

Where,

ΔCG is a distance of change in the center of gravity;

R is a radius of gyration of the two-wheeled vehicle; and

G is gravity.

16. (new) The two-wheeled vehicular motion simulation arrangement of claim 15 wherein the Theoretical Method of Operation further operates in response to a steering torque T_s applied to the steering arrangement under the equation:

$$\text{Roll Acceleration} = (((T_sG)/(C\cos \theta_z))(\cos \theta_z))/M)/R$$

Where,

T_s is the steering torque; and

M is a total mass of the two-wheeled vehicle and any rider thereon.--